Language development in children with psychiatric impairment.
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Semantic/pragmatic language abilities in the conversational interview and narrative genre

Claudia Blankenstijn

10.1 Introduction
The acquisition of morphological/syntactic rules is more or less complete around the age of six years and the number of errors that children make have decreased to 'normal' proportions, that is the level of performance errors from adults (Van den Dungen and Verbeek, 1994, 1999) (see 4.1). The acquisition of semantic and pragmatic rules takes a much longer time, there being a major development from age six onward during the school years. The acquisition of some semantic and pragmatic rules is not even finished by adulthood (e.g. Smith and Leinonen, 1992; Ninio and Snow, 1996; Roelofs, 1998:180). In this study, only those semantic aspects that have a direct effect on the pragmatic rules for language use are incorporated. For instance, when pragmatic violations are caused by a semantic disability to specify referents, subjects (persons and animals), objects (things), actions or events. This area will be referred to as semantics/pragmatics (see 3.5).

Our goal is here to understand how the Dutch-speaking PI-children develop semantic/pragmatic abilities in the conversational interview genre, i.e. an interview is a specific type of conversation, and narrative genre. This involves the investigation of whether and how frequently PI-children make specific semantic/pragmatic violations compared to the N-children. Aspects that will be considered are, for example, taking very long 'thinking' pauses when asked questions, interrupting the interviewer, failing to answer questions by giving no or only minimal responses, showing unwillingness to engage in communicative interaction, trying to change roles by expressing informative requests, being unable to tell anecdotes, being unable to detect and repair misunderstandings, ignoring the questions asked, frequently shifting the topic of conversation, giving another answer than intended or asked for, engaging in odd associations and reasoning, telling the same information twice, leaving out essential or giving ambiguous information, using unclear reference, being unable to make appropriate lexical choices, talking irrelavantly and about things the listener shows no interest in, assuming no prior knowledge, and so on (e.g. Fey and Leonard, 1983; Prutting and Kirchner, 1983; Adams and Bishop, 1989; Bishop and Adams, 1989; McTear and Conti-Ramsden, 1992; Smith and Leinonen, 1992; Ninio and Snow, 1996).

This study is limited to the analysis of only the most frequent violations that can be found in the conversational interview and narrative genres. For instance, not included here are: using intimate address forms with older people or superiors, dominating the conversation, expressing direct commands instead of polite requests, failing to greet people or not looking at the communication partner (e.g. Brown and Levinson, 1978). Violations of politeness rules were not the main focus, nor
sentence internal pauses and mazes (Fletcher, Garman, Schelleter and Stodel, 1986). We did not include either non-verbal difficulties, for instance, abnormal body positioning, such as sitting under the table and with your back to the interviewer, although this did happen in interviews with PI-children. The analysis of foul language that is found to be typical for some PI-children, especially those with externalizing PI (Gresham, MacMillan and Bocian, 1996) was also not included, since it was not part of the semantic/pragmatic model we used (Roelofs, 1996, 1998).

It is obvious that children have to learn more than only avoiding pragmatic violations. In the conversational interview genre, children have to acquire the ability to answer many different types of questions, for example about friends, games and pets and so on. These questions change in complexity with age. The questions asked by the interviewer can vary in form and content from simple yes/no?, where? or when? questions to questions that ask for a motivation why? or a manner description how? The pragmatic function of a request for information can also vary from direct and overt to more indirect and covert. A direct and overt question has an interrogative form not only linguistically marked by its inversion of word-order and starting with a question-word, but also marked with a clear rising intonation pattern. An indirect and more implicit request can have the form of a declarative that functions as a prompt for further information. Thus, children have to learn to deal with questions that vary in form, content and directness, the complexity depending on the interviewer's style. In the narrative genre, the complexity level stays the same: all children have to learn to take a long turn without any help, to embed the picture-elicited Frog story in time, to tell the complete overall plot line and to establish clear reference. Analysis of language use in both genres gives deeper insight into the language difficulties in the area of semantic/pragmatics, since these tasks require different skills. They also place demands on children that resemble everyday performance demands.

The general picture for normal semantic/pragmatic development is that as the N-children grow older, the conversational turn will become longer, they can answer more clearly and more explicitly and keep track of the conversational topic. The semantic/pragmatic language skills in both genres improve, and the frequency of violations, such as mentioned above, decreases (e.g. Roelofs, 1998). Here we will consider the relative speed of semantic/pragmatic development and the kind of deficiencies shown by the PI-children compared to the N-children.

In the field of semantics/pragmatics no clear adult norms are available for most rules, that is in terms of 100% correct behaviour. The application of the frequency criterion for acquisition, 90% occurrence in obligatory contexts (Brown, 1973), is rarely possible.

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1 Non-fluent phonological, lexical or structural sentence-internal repetitions and/or revisions are called 'mazes' (Fletcher, Garman, Johnson, Schelleter and Stodel (1986)).
In general, semantic/pragmatic rules are applied less strictly than morphological/syntactic rules (Bax, 1995). Only recently Roelofs (1998) has provided more information on the semantic/pragmatic development in school-aged Dutch-speaking N-children. These results provide a normed reference group for comparison with PI-children. In this study norm or qualitative referenced comparison is sometimes preferable to the use of a quantitative frequency criterion. To give an example: it is not appropriate for children to ask requests for information when they themselves are questioned in the conversational interview genre. We could therefore decide that only a few instances of this inappropriate semantic/pragmatic behaviour indicates the existence of broader semantic/pragmatic deficiencies.

Isolated instances of deviant semantic/pragmatic behaviour are probably as important as larger numbers of semantic/pragmatic behaviours that share common elements and features. When taken together, these relatively isolated instances may form some sort of regularity or consistency in a deviant pattern. For instance, long pauses between turns, interruptions and missed turn chances, whereby each occurs for less than 10%, can all three contribute to the disturbance of smooth turn taking and accumulate to 30% disruptions in smooth turn taking. This is comparable to the relative infrequency of different types of missing obligatory sentence elements, but which taken together form a regular deviant pattern in the area of morphosyntax. Especially in the field of semantic/pragmatics, presenting taxonomies for clinical assessment on both quantitative and qualitative grounds seems to be the best option. (see for an overview Bloom and Lahey, 1987:325-330). This seems the only way to develop more fine-grained assessment tools in the future.

Children with semantic-pragmatic LI have great trouble using language socially, in ways that are appropriate or typical of same-aged N-children. Semantic/pragmatic deficiencies are usually first noticed in LI-children in the age range of six to twelve years and can become increasingly obvious as LI-children's morphological/syntactic skills improve (e.g. Bishop, 1989; Smith and Leinonen, 1992). Most investigations have confirmed that English-speaking PI-children with different types of psychiatric impairments in general frequently have moderate to severe semantic/pragmatic difficulties (Audet and Tankersley, 1999; Donahue, Hartas and Cole, 1999; Westby, 1999). From pilot studies for this project in Dutch it emerged that the children show differences from normal children in their semantic/pragmatic behaviour (Kolthoff, 1989; Ran and Smits, 1990; Velgersdijk, 2001) but their semantic/pragmatic difficulties have been described in rather general terms. The study of co-referential cohesion (Dijkhuis, 1994) and semantic (dis)abilities (Polišenská, 2003) also showed some problems. From these studies, however, it is not clear whether and how specific aspects, such as turn taking or coherency, are affected in many PI-children and whether they show delayed or atypical behaviour in the semantic/pragmatic language area (see also 1.1 and 4.1).

Children with semantic/pragmatic disorders are also called 'children with semantic-pragmatic deficit syndrome' (Rapin and Allen, 1983), 'children with semantic-pragmatic disorder' (e.g. McTear and Conti-Ramsden, 1992) or, more recently,
Chapter 10  Semantic/Pragmatic conversational development

'children with pragmatic LI' (PLI; Bishop, et al., 2000). From the developmental literature there appears to be a continuum, with these LI-children with semantic/pragmatic disorders on the one hand and PI-children on the autistic spectrum with similar communication problems on the other (Wing, 1988; Rapin and Allen, 1987; Bishop, 1989; Bishop and Rosenbloom, 1987; Smith and Leinonen, 1992; Van Berckelaer-Onnes, 2002). This means that there are PI-children with LI in which the limited use of language appears to be a reflection of general withdrawal from interpersonal contact. On the other hand, there are LI-children with additional symptoms of PI who are characterized as having limited interpersonal contact. They may be withdrawing from contact because of difficulty in the area of semantics/pragmatics (e.g. Bloom and Lahey, 1978:598). Groups of PI-children with semantic/pragmatic LI that can be placed on such a continuum, are seen as having difficulties in acquiring specific semantic/pragmatic rules needed to cope with everyday social interaction (e.g. McTear and Conti-Ramsden, 1992) (see 1.3.2 and 1.3.3).

Recently, however, most researchers claim that the areas of morphology/syntax and semantics/pragmatics are both affected in most PI-children with different types of internalizing and/or externalizing disorders (Van Berckelaer-Onnes, 1997; Cohen et al., 1998; Cohen et al., 2000; Beitchman et al., 2001). As the previous Chapters 4 to 9 have shown, it is clear that most Dutch-speaking PI-children, although not all, are observed to have morphological/syntactic difficulties in both genres. They produce too many ungrammatical contributions that are often not properly informative and difficult to understand. Some semantic/pragmatic violations may be related to problems on the level of morphology/syntax (e.g. Kolthoff, 1989; Ran and Smits, 1990; Mills and Tso, 1991; Mills, Pulles and Witten, 1992; Dijkhuis, 1994). For instance, unclear reference (see 13.4 and 14.4) can be related to – and even caused by – missing obligatory grammatical arguments (see 5.3 and 5.4). As discussed earlier (see 4.1) it is important for language acquisition theory to explore the interrelationship between specific morphological/syntactic and semantic/pragmatic phenomena, and the interface between these two language areas. Specific populations, such as children with (specific) psychiatric disorders, can offer even more insight into this relationship. The main aim of this study is however to develop a sub-classification of PI-children on the basis of more fine-grained characteristics of language performance.

As stated earlier (3.5), we cannot compare the PI-children to the N-children from the STAP-population on the general measures for semantic/pragmatic incorrectness. The population used for comparison is taken from the Roelofs' study (Roelofs, 1998). In Table 10.1 we present the set of variables used to study semantic/pragmatic conversational and narrative abilities. In order to be able to compare the results in the PI-children with the N-children from the Roelofs-population, we explored turn taking abilities under the heading of the structure of conversation (Chapter 10), such as the ability to produce long turns (10.4), the detection of brief and excessive talkers (10.5) and the ability to take turns smoothly (10.6). Under the
heading of *form-function* (Chapter 11) we investigated the ability to be responsive (11.2 to 11.5) and repair mis-communications (11.6). Under the heading of the *content* of the conversational interview genre, we looked at the ability to transmit relevant information (Chapter 12 and 13), such as the ability to manage the conversational topic (12.1), and the ability to link contributions coherently (12.3 to 12.8) and cohesively (13.2 and 13.4), with special emphasis on the ability to establish clear reference (13.5 to 13.8). The semantic/pragmatic ability to use linguistic expressions to achieve coreferential cohesion is one of the major and very important areas of development during the school years. Making clear to others which person, animal, thing or event one is talking about is a necessary condition for good conversation and narrative. This development is strongly connected to the social-cognitive ability to take into account the listener's perspective, being part of the development of a Theory-of-Mind (see 2.3.3).

In the narrative genre, we will look at the PI-children's ability to fulfil the narrative task, taking into account the fact that they have to tell a picture-elicited story on their own without any help of the interviewer (see 3.4.1, 9.1 and 14.1). More important, we will investigate how the PI-children learn to express the time-embedding of the story (14.2), the overall plotline (14.3) and how they establish clear reference (14.4 to 14.7). A genre comparison is only made for the ability to establish clear reference (14.8) (see Table 10.1).

For each of the abilities a hierarchical coding system of subordinate coding categories was developed that specify a certain variable. Each semantic/pragmatic variable will be discussed and motivated in the following chapters. The coding categories represent the difference between semantically/pragmatically appropriate versus inappropriate communicative behaviour, where possible. As stated in 3.6, we follow the Explanatory Criterion (Burisch, 1984) that uses significant differences in group effects to classify deviant from normal semantic/pragmatic behaviour. As pointed out earlier (see 3.5), however, the group differences found on one specific variable in the area of semantics/pragmatics cannot exclusively justify the classification of a semantic/pragmatic disorder. It is only the combination of different deviations from the standard on more measures that can point towards semantic/pragmatic impairment.

In Table 10.1, the numbers 10 to 14 refer to the specific chapters that present the results of a specific variable. Each section contains a motivation of the specific linguistic variable; the research variable is then defined and operationalized. Finally the results related to the specific semantic/pragmatic variable are presented. Each section will be rounded off with concluding remarks. Finally, in section 13.9 the general conclusions are formulated on the basis of the results of the complete semantic/pragmatic analysis of the conversational interview genre, and in section 14.9 the same will be done with respect to the narrative genre.
Table 10.1 The complete set of main variables for the analysis of semantic/pragmatic abilities in the conversational interview and narrative genre

<table>
<thead>
<tr>
<th>Structure conversation</th>
<th>Form-Function conversation</th>
<th>Content conversation</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 Turn taking abilities</td>
<td>11 The ability to be responsive and repair</td>
<td>12/13 The ability to transmit relevant information</td>
</tr>
<tr>
<td>10 The ability to produce long turns</td>
<td>11 The ability to be responsive</td>
<td>12 The ability to manage the conversational topic</td>
</tr>
<tr>
<td>Communicative contributions</td>
<td>Missed turn chances</td>
<td>Topic introduction</td>
</tr>
<tr>
<td>Turns</td>
<td>Minimal responses</td>
<td>Topic continuation versus link</td>
</tr>
<tr>
<td>MLT and LLT</td>
<td>Function second pair parts children</td>
<td>Topic hold</td>
</tr>
<tr>
<td>Long Turns</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brief and Excessive talkers</td>
<td>Extended discourse with a narrative character</td>
<td></td>
</tr>
<tr>
<td>10 The ability to take turns smoothly</td>
<td>11 The ability to repair</td>
<td>12 The ability to follow the Maxims</td>
</tr>
<tr>
<td>Types smooth turn exchanges</td>
<td>Repairs</td>
<td>Maxim of relation</td>
</tr>
<tr>
<td>Types non-smooth turn exchanges</td>
<td>Requests for clarification</td>
<td>Maxim of relevance</td>
</tr>
<tr>
<td>Gap lengths</td>
<td></td>
<td>Maxim of quantity</td>
</tr>
<tr>
<td>Types of speech overlap</td>
<td></td>
<td>Maxim of quality</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Maxims of manner</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Structure narrative</td>
<td>Form-Function narrative</td>
<td>Content narrative</td>
</tr>
<tr>
<td>14 Narrative task</td>
<td></td>
<td>14 The ability to tell a narrative</td>
</tr>
<tr>
<td>Narrative contributions</td>
<td></td>
<td>Embedding narrative in time</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Narrating the plot</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Co-referential cohesion</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Genre comparison</td>
</tr>
</tbody>
</table>

10.2 Turn taking: the ability to produce long turns and to take turns smoothly

Since the turn taking system is more constrained for the conversational interview genre than for every-day conversations, we may expect that the interview task somehow reduces difficulties in turn taking (e.g. Greatbatch, 1988). However, it may still be problematic enough for some children. A good interview is characterized by short turns produced by the interviewer on the one hand and by smoothly taken, long turns produced by the N- and PI-children on the other. It is possible that smooth turn taking precedes the production of longer turns developmentally, since it is more challenging to produce longer meaningful turns than to work out the timing of exchanges (e.g. McTear and Conti-Ramsden, 1992). It is not until four years that children start to talk about past events and everyday life experiences in longer turns and with a precise timing of turns (McTear, 1985).
Turn taking starts quite early in life. From age two on, children learn to speak about the non-present (Greenfield and Smith, 1976; Ninio and Snow, 1996) and to express utterances in longer stretches of talk (Bloom and Lahey, 1978), before they can combine these two abilities. When four-year-old N-children produce longer turns, they first need the support of others to do so, but from age five/six on N-children become able to produce longer conversational turns without prodding or feedback (Karmiloff-Smith, 1986; Peterson and Dodsworkth, 1991; Schober-Peterson and Johnson, 1993). These longer conversational turns are called extended discourse in the developmental literature (Ninio and Snow, 1996).

However, although in general it can be supposed that as N-children grow older they develop a feeling for smooth turn taking, little is known about the relative speed of the development of turn taking abilities and the frequency of occurrence of non-smooth turn alternations in school-aged N-children. For instance, in interviews with the 75 Dutch-speaking N-children it was only partly confirmed that they become better turn takers with age, since speech overlap and gaps (pauses) between turns did not decrease with age in the age range studied (Roelofs, 1998).

Even less is known about the development of turn taking abilities in school-aged LI- and PI-children. Some investigators report that LI-children do not appear to have difficulties in turn allocation itself (McTear and Conti-Ramsden, 1992), but others have observed that turn taking failures, such as long gaps and speech overlap between turns, especially interruptions, frequently occur in some LI-children, but not in all (Rosinski-McCledon, and Newhoff, 1987; Rapin and Allen, 1987; Friel-Patti, 1992). Others report smooth turn taking but low Mean Length of Turn (MLT's) in English-speaking LI-children (Fey and Leonard, 1983, Craig and Evans, 1993) and younger Dutch-speaking LI-children (Van Balkom, 1991). Most frequently, LI-children, especially LI-children with semantic/pragmatic disorder, are observed to have difficulties in producing longer turns and in taking turns smoothly (Johnson, Johnston and Weinrich, 1984; Adams and Bishop, 1989; Bishop and Adams, 1989; Craig and Evans, 1989).

Similar turn taking problems are signalled in PI-children (Hobson, 1986; Baltaxe and Simmons, 1988; Audet and Tankersley, 1999; Westby, 1999). We know that autistic and schizophrenic PI-children (who are excluded from this study) have severe turn taking disabilities (Baltaxe, 1977). Turn taking difficulties are also observed in PI-children on the autistic spectrum (Fay and Schuler, 1980). For instance, these PI-children (Bernard-Opitz, 1992; Rapin, 1996) and PI-children with ADHD are frequently observed to talk excessively (DSM-IV-TR, APA, 2000:85-93). These 'chatter-box' PI-children remain in the speaker role for too long and are considered bad conversationalists, since they neither display attentiveness nor give others opportunity to speak (Bishop and Adams, 1989; McTear and Conti-Ramsden, 1992; Rapin, 1996).

Although we might expect some deficiencies in the 120 PI-children, it is not exactly clear how and to what extent smooth turn taking and turn length are affected. Some
PI-children might be unable to produce long turns, whereas others might keep on talking. Children who produce too many short turns are named 'brief talkers' and children who produce an extremely long, but incoherent turn are further referred to as 'excessive talkers' (see 10.5).

In the following, we will explore the PI-children's turn taking abilities. First, we will describe the ability to produce long turns (10.4) and detect brief and excessive talkers (10.5). Then, we will explore the ability to take turns smoothly by counting the amount of non-smooth turn exchanges, i.e. the amount of gaps (pauses) and speech overlap between turns (10.6), ending with the conclusion (10.7). But first, we start with an introduction of the most basic units of the semantic/pragmatic analysis in the conversational interview genre: communicative contributions and turns (10.3).

10.3 Communicative Contributions and Turns

10.3.1 Research questions, definitions and operationalisations

Since communicative contributions and turns are the most elementary units of transcription, segmentation and analysis, their influence on the analysis of many different types of semantic/pragmatic abilities must not be underestimated. Here, we want to know whether the number of communicative contributions and turns in interviews with PI-children are comparable to the amount in interviews with N-children. And, is there comparable development with age?

Communicative contributions (CC) are all verbal plus a small selection of non-verbal contributions that can vary in form, length, content and function. The boundaries between communicative contributions (within a turn) are largely based on STAP (Van den Dungen and Verbeek, 1994, 1999): the morphological/syntactic and semantic unity of one contribution and the completeness of its intonation contour set the boundaries between contributions. However, we had to make some adjustments on STAP following Roelofs (1998). In what follows we make explicit what linguistic information is part of a specific type of communicative contribution.

Each interview must minimally contain 50 communicative contributions from the child in the form of a T-unit, according to STAP (Van den Dungen and Verbeek, 1999) (see 3.3 and 4.2). The focus here is on the semantic/pragmatic analysis of a semi-structured interview between adult and child; we therefore analysed more material than these 50 T-units. For instance, unlike STAP, (non-verbal) yes/no answers (see 11.7) and elliptical answers (further named clausal ellipsis; see 8.3 and 13.2) are coded as separate communicative contributions. Other communicative gestures, such as points, are transcribed but not further analysed. The non-verbal communicative contributions of the interviewer were not accessible, and therefore not coded, because the N- and PI-interviewers were not in camera.
Unlike STAP, that only includes conversational contributions on a topic outside the here and now, we analysed the first communicative contribution about the here-and-now (mostly coded as unmarked topic shift; see 12.3), whereas the following, successive contributions about the here-and-now were only transcribed and not further analysed.

We also analysed breaks as missed turn chances (see 11.2). Breaks are communicative contributions that are unfinished (without a complete predicate) and therefore mostly (partly) unintelligible communicative contributions, due to pronunciation or speech-rate problems of the children, background noise or speech overlap. However, totally unintelligible communicative contributions expressed by the N- and PI-children were excluded from further analysis.

We coded feedback as separate communicative contribution, but interjections, such as 'do you know', 'look' or 'listen' not. Feedback is mostly expressed by the interviewer, such as 'hmm', 'yes' or 'no', and is analysed as a signal of the N- and PI-interviewers' communicative support (see 11.1). The different types of communicative contributions included in all semantic/pragmatic analyses are set out in Table 10.2.

Table 10.2 The coding categories of the variable communicative contribution

<table>
<thead>
<tr>
<th>Communicative contributions Child</th>
<th>Communicative contributions Interviewer</th>
</tr>
</thead>
<tbody>
<tr>
<td>- 50 T-units (see 4.2)</td>
<td>- T-units</td>
</tr>
<tr>
<td>- non-verbal yes/no answers (nods/ head shakes)</td>
<td>- verbal yes/no answers and feedback</td>
</tr>
<tr>
<td>- verbal yes/no answers and feedback</td>
<td>- elliptical answers (clausal ellipsis)</td>
</tr>
<tr>
<td>- elliptical answers (clausal ellipsis)</td>
<td></td>
</tr>
<tr>
<td>- breaks</td>
<td></td>
</tr>
</tbody>
</table>

Younger children (both N- and PI-children) and PI-children are expected not to have the semantic/pragmatic competence needed to give elaborate answers. For instance, they frequently interpret questions in a more literal way (Example 1).

Example 1 Literal interpretation (PI-child; 4;8)

<table>
<thead>
<tr>
<th>Interviewer:</th>
<th>Rick:</th>
</tr>
</thead>
<tbody>
<tr>
<td>kun je wat over je zusje vertellen?</td>
<td>ja.</td>
</tr>
<tr>
<td>(can you tell me something about your sister?)</td>
<td>(yes)</td>
</tr>
</tbody>
</table>

These N- and PI-children are therefore expected to produce more extra communicative contributions that have the form of yes/no answers or elliptical answers in addition to the 50 T-units in each conversational interview (see 3.3 and 4.2.1).
A *turn* (T) starts when a speaker speaks and continues until the speaker stops. A turn can have different forms (Table 10.3).

Table 10.3  The coding categories of the variable turn (for both interviewer and child)

<table>
<thead>
<tr>
<th>Turns</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>- (non) verbal yes/no answer (+ one or more T-units)*</td>
<td></td>
</tr>
<tr>
<td>- elliptical answer (+ one or more T-units)</td>
<td></td>
</tr>
<tr>
<td>- (non)verbal yes/no answer + elliptical answer (+ one or more T-units)</td>
<td></td>
</tr>
<tr>
<td>- one or more T-units</td>
<td></td>
</tr>
</tbody>
</table>

*the contributions between brackets ( ) are optional

The boundaries between turns are not exactly based on the model of Sacks, Schegloff and Jefferson (1974) (see for a critical review Roelofs, 1998:28-29), but on STAP (Van den Dungen and Verbeek, 1994, 1999) and our adjustments on STAP, following Roelofs. The boundaries between contributions as defined above are also applied with respect to the last contribution of the previous turn and the first contribution of the successive turn. However, in order to analyse the ability to take turns smoothly, we based our analysis on Jefferson's (1989) assumption that taking turns smoothly involves avoiding gaps longer than 1 second and speech overlap between turns (see 10.6).

From Table 10.3 we see that a turn can contain one or more of the following communicative contributions: a single (non)verbal yes/no answer (Example 2); a single elliptical answer (Example 3); a T-unit (Example 4) or a combination of contributions, such as three successive T-units (Example 5).

Example 2  A single non-verbal 'no' coded as one turn (PI-child; age 7;8)

Interviewer: hebben jullie thuis huisdieren?  (do you have pets at home?)
Emiel: Ø (shakes no)

Example 3  A single elliptical answer coded as one turn (PI-child; age 7;4)

Interviewer: hoe heet jullie poes?  (what is the name of your cat?)
Michiel: <eh> Casper.

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2 See Appendix 4a for transcription symbols
Turn taking abilities

Example 4  
*A single T-unit coded as one turn (PI-child; age 7;4)*

Interviewer:  
nou vertel eens wat over de vissen.  
(now tell me something about the fish)

Maaike:  
<hm> die krijgen gewoon eten.  
(‘<hm> they just get food)

Interviewer:  
ja.  
(yes)

Feedback interviewer

Example 5  
*Three communicative contributions coded as one turn (PI-child; age 7;9); conversational topic: games with sisters*

Interviewer:  
wat doen jullie dan?  
(what do you do so?)

Mark:  
ik speel heel vaak met me kleine zusje.  
(I very often play with my little sister)

Mark:  
gaan we heel vaak tekenen.  
(we very often draw)

Mark:  
en met me grote zus ga ik heel vaak met de bal overgooien.  
(and with my elder sister I very often play with the ball)

Other combinations of these categories that form one turn are also possible, for instance, one turn contains one non-verbal yes/no answer plus one elliptical answer plus one T-unit (see Table 10.3). Since the analysis of turn taking abilities is based on the segmentation of communicative contributions into turns, in interviews with a higher number of communicative contributions also a higher number of turns is expected. Namely, if N- and PI-children express many (non)verbal yes/no answers and/or elliptical answers but relatively few Long Turns (= three successive T-units or more), the interviewer must ask more questions until the 50th T-unit is reached. The interview is then relatively long and the transmission of information progresses relatively slowly (Example 6).

Example 6  
*Part of a relatively long interview (PI-child; age 6;10)*

Interviewer:  
heb je huisdieren thuis?  
(do you have pets at home?)

Danny:  
#1 ja.  
(#1 yes).

Interviewer:  
ja?  
(yes)

Danny:  
ja  
(yes)

Interviewer:  
vertel er eens over.  
(tell me about it)

Danny:  
een hamster.  
(a hamster)

verbal yes/no answer

verbal yes/no answer

elliptical answer
In Example 6, the PI-interviewer takes three turns and the PI-child takes three turns, but no single T-unit was elicited. On the contrary, if N- and PI-children produce more extended discourse, fewer questions have to be asked and thus fewer turn alternations are involved. In that case, the interview is less time consuming, because more is said in less time (Example 7).

Example 7

Interviewer: heb je huisdieren thuis? (do you have pets at home?)
Paul: ja. (yes)
Paul: ik heb veel vissen en twee katers I have many fish and two tom-cats.
Interviewer: vertel er eens over. (tell me about it)
Paul: nou, één loopt de hele dag achter je aan. (well, one follows you about the whole day)
Paul: en de andere, die jaagt vee1. (and the other one hunts a lot)

In Example 7, two turns of the PI-interviewer elicit two turns of the PI-child, that consist of 1 verbal yes/no answer plus 1 T-unit (turn one), and two T-units (turn two). Although all language material in the interviews was divided into contributions and turns for both N- and PI-interviewers and N- and PI-children, our main interest here concerns the development of turn taking abilities in the PI-children as compared to the N-children (Roelofs, 1998). Therefore, we will only present the results of the N- and PI-children.

10.3.2 Results: Communicative Contributions and Turns

Contrary to our expectation, we found that the PI-children produce significantly fewer communicative contributions3 than the N-children, due mainly to the four- and six-year-old N-children (see Figure 10.1). With increasing age, the N- and PI-children produce significantly fewer communicative contributions4 until the limit of 50 T-units is reached. This means not only that younger N- and PI-children produce more communicative contributions in the form of a yes/no answer or elliptical answers (or both) to arrive at 50 T-units, but also that the older N- and PI-children answered more in (successive) T-units. As a consequence, in both the N- and PI-children the interviews become shorter and less time consuming with age. A relatively long interview took 40 minutes and a short interview 20 minutes on average.

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3 ANOVA: group effect F(1,165)=4.04, p<0.046; age effect F(4,165)=8.95, p<0.0001 (nine-year-old PI-children excluded).
4 Oneway ANOVA: N-children F(4,70)=5.52, p<0.001; Eta squared .24, R squared .18; PI-children F(5,114)=6.11, p<0.0001; Eta squared .21, R squared .18 (nine year-old PI-children included).
Turn taking abilities

**Figure 10.1** The mean total number of communicative contributions expressed by 75 N-children (Roelofs, 1998) and 120 PI-children in the conversational interview genre

![Graph showing mean total number of communicative contributions across ages for N- and PI-children.]

When we compare the number of turns expressed by the N- and PI-children\(^5\) (Figure 10.2), we observed – contrary to our expectations and despite the relatively higher amount of turns produced by the six-year-old N-children – no significant group effect.

**Figure 10.2** The mean total number of turns expressed by 75 N-children (Roelofs, 1998) and 120 PI-children in the conversational interview genre

![Graph showing mean total number of turns across ages for N- and PI-children.]

\(^5\) ANOVA (nine-year-old PI-children excluded)
This means that the N-children produce not only significantly\(^6\) more very short yes/no and/or elliptical answers, but also produce more long turns than the PI-children, so that the mean total number of turns becomes equal in both groups. With age the number of turns linearly decreases\(^7\) in both N- and PI-children at a similar rate. Thus, with age the PI-children express fewer short answers and more long turns, comparable to the N-children (see also Roelofs, 1998:80).

10.3.3 Conclusion: Communicative Contributions and Turns

We conclude that, contrary to our expectations, the N-children needed more communicative contributions than the PI-children to arrive at 50 T-units, but produced a comparable amount of turns. With age we see a similar decrease in communicative contributions and turns, whereby the developmental rate of the decrease is the same in both N- and PI-children. Thus, the interviews are on the whole comparable in quantity with respect to the number of turns. Turns are further analysed according to their length, as will be presented in the next section.

10.4 The ability to produce Long Turns

10.4.1 Research questions, definitions and operationalisations

In order to explore the ability to produce turns of a substantial length, we first counted all turns in terms of successive T-units, varying from 'one turn = (1 T-unit)' to 'one turn = 36 successive T-units' (i.e. the longest turn observed in all data). Since only turns with a length of more than one T-unit are a measure of complexity, turns in the form of a single yes/no-answer or elliptical answer (not counted as a single T-unit) (see Table 10.3) are excluded from the analysis.

Then we calculated the Mean Length of Turns (MLT) and the length of the longest turn (LLT). The MLT and LLT (computed per child and per age group) significantly\(^8\) correlate, because the LLT is included in computing the MLT.

We have seen that the number of turns significantly decreases with age in the PI-children and at the same rate as in the N-children (10.2). Therefore, both N- and PI-children are expected to produce more relatively longer turns with age. With respect to the MLT no group effect was found but an age effect\(^9\) was (Appendix 10; Figure 10a): with age the MLT linearly increases\(^10\) from 1.7 T-units per turn at age four in

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\(^6\) ANCOVA with the number of turns as covariate; group effect F(1,164)=9.19, p<0.003 (nine-year-old PI-children excluded).

\(^7\) One-way ANOVA: N-children F(4,70)=6.28, p=0.0001, Eta squared .26, R squared .20; PI-children (nine-year-old PI-children included) F(5,114)=6.85, p<0.0001, Eta squared .23 and an R squared .20.

\(^8\) Pearson's chi-square (2-sided)=0.78, p<0.0001.

\(^9\) ANOVA: age effect F(4,165)=7.57, p<0.0001; no significant group effect or age*group interaction effect was observed (nine-year-old PI-children excluded).

\(^10\) One-way ANOVA: N-children F(4,70)=4.46, p<0.003; Eta squared .26, R squared .20; PI-children F(4,95)=3.28, p<0.015; Eta squared .12, R squared .11; if we include the nine-year-old PI-children, we even observed an Eta squared .26; R squared .19.
both groups to 2.6 in the eight-year-old N-children and to 2.4 T-units per turn in the eight-year-old PI-children. Nine-year-old PI-children even have a MLT of 4 successive T-units. Notwithstanding the linear increase found in both groups, we noted that unexpectedly many relatively short turns (< 3 T-units) are elicited in this genre in both populations. In discourse with familiar adults N-children even as young as four years of age are known to produce long(er) turns (Eisenberg, 1985).

In order to detect PI-children that talk excessively (see 10.5), we explored differences in LLT (Appendix 10; Figure 10b). The mean LLT per age group is approximately 4 to 7 T-units higher than the mean MLT per age group. The differences between the groups are too small to observe a significant group-effect. As expected, the LLT linear increases with age in both N- and PI-children and at the same rate. The LLT increases from approximately 5.1/6.3 to 9.0/9.6 T-units, and even to 12.3 T-units in the nine-year-old PI-children. This sudden fast increase of the LLT between the ages of eight and nine years suggests that at age eight the ability to take longer turns is still in development.

As we know from the literature, the PI-population may contain brief talkers and excessive talkers. This can lead to the MLT not showing any group difference, since extremely low and high MLTs might cancel each other out when computing the total mean per child and per age group. This was in fact the case. A finer differentiation therefore was needed to detect possible differences between the PI- and N-children. It has been reported frequently that some PI-children, although probably not all, have difficulties in producing long turns (e.g. Audet and Tankersley, 1999; Westby, 1999). It was then decided to investigate the number of Long Turns (3 successive T-units or more). By exploring the production of long turns it is possible that differences will show up, since these long turns require more linguistic effort than shorter turns. Here, we want to know whether the number of Long Turns expressed by PI-children is comparable to the amount expressed by N-children. And, is there comparable development with age?

Since the MLT significantly increases with age in the PI-children, we expect that the older PI-children express more long turns (3 successive T-units or more) than the younger PI-children. The following analysis of the production of long turns will indicate if the groups really are the same.

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11 One-way ANOVA: N-children F(4,70)=4.27, p< 0.004, Eta squared .20, R squared .14; PI-children F(4,95)=5.10, p=0.0001, Eta squared .18, R squared .16; if we include the nine-year-old PI-children, we even observed an Eta squared of .21 and an R squared of .20.
10.4.2 Results: Long Turns

In Figure 10.3 we present the percentages Long Turns (≥ 3 successive T-units).

Figure 10.3 The percentages long turns (calculated over all turns) in 75 N-children (Roelofs, 1998) and 120 PI-children

We see that the percentages long turns are comparable in the younger N- and PI-children, but higher in the seven- and eight-year-old N-children than in the same-aged PI-children, resulting in a significant group effect.

10.4.3 Conclusion: Long Turns

The PI-children as a group produce significantly fewer long turns than the N-children, mainly due to the relatively low production of long turns in the seven- and eight-year-old PI-children. This is comparable to earlier reports with respect to English-speaking PI-children (Hobson, 1986; Audet and Tankersley, 1999; Westby, 1999). This analysis, however, still does not allow us to see whether there are individual PI-children with an extremely low MLT and LLT (brief talkers) or whether there are individual PI-children that produce a longest turn (LLT) that is extremely long, but incoherent (excessive talkers). The results of this analysis will be presented in the next section.

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12 ANCOVA with the number of turns as covariate; group effect F(1,164)=11.64, p<0.026; no significant age or age*group interaction effect was found (nine-year-old PI-children excluded).
10.5 Brief and Excessive Talkers

10.5.1 Research questions, definitions and operationalisations
To detect brief talkers, we looked at the distribution of the percentages N-children and PI-children who had extremely low scores on the variables MLT and LLT (Length of the Longest Turn).
To detect excessive talkers, we looked at the distribution of the percentages N-children and PI-children who had extremely high score on the variable LLT and produced an incoherent longest turn (LT). The two categories of brief and excessive talkers are mutually exclusive, as brief talkers do not produce an extremely long longest turn, and excessive talkers do not have a low score on the MLT or LLT. Here, we want to explore whether there are as many brief talkers and excessive talkers in the PI-children as in the N-children.

As mentioned earlier (10.2), a good interview is characterized by relatively short turns produced by the interviewer and relatively long turns produced by the N- and PI-children. When brief talkers produce too many too short turns for their age, they might not be motivated or willing to communicate or they might have problems with the transmission of linguistic information in successive T-units. They might not know what to say next about a conversational topic (e.g. Ninio and Snow, 1996) or they might be frightened to make linguistic mistakes (e.g. Hadley and Rice, 1991). In this case, more effort is needed to get linguistic information from the N- and PI-children who say relatively little in a relatively long time-span. Then, the transmission of information is not efficiently organized.

When excessive talkers keep talking and produce an extremely long and incoherent LT that is often not completely intelligible, they are willing and motivated to communicate. However, they often remain in the speaker role for too long and give the interviewer no opportunity to react on what is said (McTear and Conti-Ramsden, 1992). As a consequence, although the interview takes less time, but the interviewer can only guess what these N- and PI-children are trying to say. Frequently, after such an extremely long and incoherent LT a lot of requests for clarifications are necessary to come to a better understanding (11.1). Both brief and excessive talkers show clear – although distinct – semantic/pragmatic difficulties in efficiently transmitting relevant linguistic information.

N- and PI-children that score below average $z \leq -1$ on both MLT and LLT were diagnosed as brief talkers. This does not mean that they cannot produce longer turns in another communicative situation, but the production of predominantly very short turns shows a clear disability in expressing more utterances in a row in the conversational interview genre. Only if they scored below average $z \leq -1$ on both variables, were they diagnosed as brief talkers. We excluded the N- and PI-children that only stand out on the MLT, since these children might produce at least only once a longest turn with a turn length that is adequate for their age. We also exclude the N- and PI-children that only stand out on the LLT, since these children might produce turns with a turn length that is adequate for their age, except for the longest
turn. We expect there to be more PI-children than N-children to deviate on both variables.

Next, N- and PI-children that score above average $z \geq +2$ on the variables LLT are diagnosed as excessive talkers, but only if this extremely long LT is characterized by many incoherently linked contributions. This was judged according to the ability of the N- and PI-children to follow the maxims of Grice (1975) (see 12.2 to 12.8). These incoherently linked successive communicative contributions might contain many morphological/ syntactic errors (see 4.2) that negatively influence the overall impression of coherency.

Although the boundary between a good and excessive talker is debatable, the N- and PI-children that produced coherent, long turns are diagnosed as good talkers, because a long (above average) coherent turn is usually a sign of sophisticated semantic/ pragmatic behaviour. Since good talkers fall mostly between $+1 > z > +2$, we took $z \geq +2$ (and not $z \geq +1$) as the cut-off point to detect the excessive talkers.

To examine whether more PI-children than N-children are diagnosed as brief or excessive talker, two nonparametric tests, Chi-square and Fisher's Exact test were computed. We expected to find more brief and excessive talkers in the PI-children than in the N-children.

### 10.5.2 Results: Brief and Excessive Talkers

We present the distribution of the percentages N-children and PI-children categorized according to their scores on the variables MLT and LLT. The brief talkers must score below average $z \leq -1$ on both variables (Table 10.4).

<table>
<thead>
<tr>
<th>Brief talkers</th>
<th>N-children n=75</th>
<th>PI-children n=120</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MLT $z \leq -1$ n=</td>
<td>LLT $z \leq -1$ n=</td>
</tr>
<tr>
<td>4 yrs</td>
<td>$\leq 1.39$ 2 $\leq 3$ 1 1</td>
<td>$\leq 1.39$ 7 $\leq 3$ 6 5</td>
</tr>
<tr>
<td>5 yrs</td>
<td>$\leq 1.47$ 2 $\leq 4$ 4 1</td>
<td>$\leq 1.47$ 3 $\leq 4$ 2 2</td>
</tr>
<tr>
<td>6 yrs</td>
<td>$\leq 1.61$ 2 $\leq 4$ 6 2</td>
<td>$\leq 1.61$ 2 $\leq 4$ 3 1</td>
</tr>
<tr>
<td>7 yrs</td>
<td>$\leq 1.72$ 3 $\leq 4$ 0 0</td>
<td>$\leq 1.72$ 7 $\leq 4$ 2 2</td>
</tr>
<tr>
<td>8 yrs</td>
<td>$\leq 1.92$ 2 $\leq 5$ 1 1</td>
<td>$\leq 1.92$ 9 $\leq 5$ 5 5</td>
</tr>
<tr>
<td>9 yrs</td>
<td>- - - - - - - - 2.00 4 $\leq 6$ 8 3</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>11 12 5</td>
<td>32 26 18</td>
</tr>
<tr>
<td></td>
<td>15% 16% 7%</td>
<td>27% 22% 15%</td>
</tr>
</tbody>
</table>
In case of a normally distributed population, we expect that a maximum of 18.3% of all children fall within the marked category $MLT \; z \leq -1$ and $LLT \; z \leq -1$. We see that this holds true for the N-children (MLT: 15%; LLT: 16%). The number of PI-children (MLT: 27%; LLT: 22%) does not fall within the limits of a normal distribution. Especially in the age groups of four-year-old (30%), eight-year-old (25%) and nine-year-old PI-children (40%), many PI-children produce a longest turn that is too short compared to the N-children. In the N-children only 5 (7%) are diagnosed as brief talkers, but in the PI-population there are 18 PI-children (15%). However, this difference proved to be not significant.\(^{13}\)

Several PI-children were doing extremely poorly: there is one four-year-old PI-child that did not produce any turn longer than 1 T-unit, and one nine-year-old PI-child who produced a longest turn of only 4 T-units, the other turns being even shorter. As mentioned earlier, brief talkers have difficulty in talking about a certain topic in longer stretches of successive T-units in the conversational interview genre. These PI-children often give the impression that they do not want to talk about anything, although it is difficult to judge where the boundary lies between unwillingness (lack of motivation) and disability (see 2.3.1).

The number of N- and PI-children that produce a longest turn that is extremely long in the genre under investigation is presented in Table 10.5.

<table>
<thead>
<tr>
<th>Excessive talkers</th>
<th>N-children $n=75$</th>
<th>PI-children $n=120$</th>
</tr>
</thead>
<tbody>
<tr>
<td>$LT ; z \geq +2$</td>
<td>$n = ; $</td>
<td>$n = ; $</td>
</tr>
<tr>
<td>4 yrs $&gt; 8$ T-units</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>5 yrs $&gt; 9$ T-units</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>6 yrs $&gt; 11$ T-units</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>7 yrs $&gt; 12$ T-units</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>8 yrs $&gt; 13$ T-units</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>9 yrs -</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>9</td>
<td>1</td>
</tr>
</tbody>
</table>

Instead of the expected 2.3% in case of a normally distributed population, there are 9 N-children (12%) and 19 PI-children (16%) that produce extremely long stretches of talk. We made a judgement about the coherency of these extremely long LTs. Only

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13 Chi-square (after continuity correction) (nine-year-old PI-children included)
if N- and PI-children produce an incoherent longest turn based on our analysis of incoherence (see 12.2 to 12.8), were they diagnosed as excessive talkers. In the four-and five-year-olds the longest turns were not incoherent, and therefore judged as semantically/pragmatically adequate. We see that only one seven-year-old N-child (2%) and 12 PI-children (10%) were diagnosed as excessive talkers. These differences proved to be significant. Thus, more PI-children are diagnosed as excessive talkers than N-children.

The excessive talkers will often tax the interviewer's patience. The flow of information these N- and PI-children give is always partly and sometimes even completely unintelligible. We explored whether the T-units of the longest turns expressed by excessive talkers were incoherently linked (see Chapter 12 and 13), and/or ungrammatical (see 4.2 and 4.3) (Table 10.6).

Table 10.6 shows that a clustering of morphological/syntactic and semantic/pragmatic problems is often observed in the longest turn expressed by the excessively talking PI-children. This is comparable to an increase of clustering of morphological/syntactic errors in the five longest T-units, measured by MLUL scores (see 8.2). These failures all have a negative influence on the intelligibility of information. It was frequently observed that the PI-interviewer wanted to clarify what the PI-child was saying, but often waited with a request for clarification (see 11.1) in the hope that in what follows the message of the PI-child would make more sense. Thus, as a result of the PI-interviewers' polite, often delayed reaction, these PI-children also might stay in the speaker's role for too long.

It is possible that this type of LI (talking excessively) is characteristic of PI-children with ADHD and PI-children on the autistic spectrum, such as PDD-NOS (Bernard-Opitz, 1992; Rapin, 1996; APA, 2000). However, no clear relationship was found: only 5 PI-children of the 19 PI-children with ADHD and only 2 PI-children of the 25 PI-children with PDD-NOS (together 42%) were diagnosed as excessive talkers. There were also 5 PI-children (58%) falling within the category internalizing PI

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14 Fisher's Exact test (one-tail): p < 0.014 (nine-year-old PI-children included)
(n=2), Oppositional Behavioural Disorder (n=1), and 'No Diagnosis' (n=3) (see 3.2.1) who were diagnosed as excessively talking PI-children.

10.5.3 Conclusion: Brief and Excessive Talkers

There are more PI-children (n=30; 25%) who fall in the categories brief or excessive talkers than N-children (n=6; 8%). The individual PI-children who belong to the group of brief talkers (15%) have problems with the production of long turns as compared to peers. The individual PI-children (10%) who belong to the group of excessive talkers make extremely long, but incoherent turns that are also marked by an extreme amount of morphological/syntactic failures (see 4.2 and 4.3). Although more PI-children with ADHD and PDD-NOS were excessively talking than other types of PI-children, contrary to earlier observations (Bernard-Opitz, 1992; Rapin, 1996; DSM-IV-TR, APA, 2000:85-93) this variable does not clearly fit in a specific profile of ADHD or PDD-NOS.

10.6 The ability to take turns smoothly

10.6.1 Research questions, definitions and operationalisations

As stated in the beginning of this chapter, a good interview in Dutch is characterized by smooth turn taking with as few gaps (pauses) and speech overlap between turns as possible. In the course of their development it is supposed that most N-children acquire a fluent, rapid conversational style with a precise timing of turns (McTear, 1985). This development starts quite early in life. From age one on, N-children are already fairly good turn takers with adult interactants; by the time the first words are produced N-children can sustain long bouts of well-timed turn alternations with their mothers (Bateson, 1975). They develop a sensitivity to avoid, for example, speech overlap between turns to prevent a misinterpretation of their message. By age four N-children are able to repair overlapped parts of speech by stopping the ongoing utterance and by repeating the overlapped part (Ervin-Tripp, 1979). Although N-children become good turn takers quite early in life, violations of the turn taking principles are sometimes even made by older N-children, but these are not considered particularly serious by highly co-operative adult conversational partners (Ninio and Snow, 1996).

As already mentioned (see 10.2), some investigators state that LI-children do not appear to have difficulties in turn allocation itself (Fey and Leonard, 1983; McTear and Conti-Ramsden, 1992), but others observe that turn taking failures, such as long gaps and speech overlap between turns, especially interruptions, frequently occur in LI-children with semantic-pragmatic difficulties (Johnson, Johnston and Weinrich, 1984; Rapin, 1987; Adams and Bishop, 1989; Bishop and Adams, 1989; Craig and Evans, 1989, 1993; Van Balkom, 1991). These turn taking problems are also signalled in PI-children (Fay and Schuler, 1980; Hobson, 1986; Audet and Tankersley, 1999; Westby, 1999). Here, we want to explore whether the PI-children lag behind in the development of smooth turn
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Taking and show a higher frequency of non-smooth turn alternations than the N-children (Roelofs, 1998). In a turn exchange the beginning of the turn can be judged as a smooth or non-smooth. The categories smooth or non-smooth turn starts are mutually exclusive (see Table 10.7).

Table 10.7 The coding categories of the variable turn exchange (for both interviewer and child)

<table>
<thead>
<tr>
<th>Smooth turn start</th>
<th>No gap</th>
<th>except for a quick uptake by the child</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No speech overlap</td>
<td></td>
</tr>
<tr>
<td>Non-smooth turn start</td>
<td>Gap</td>
<td>1-2 sec., 2-3 sec., 3-4 sec. or more than 4 sec. initial overlap or interruption</td>
</tr>
<tr>
<td></td>
<td>Speech overlap</td>
<td></td>
</tr>
</tbody>
</table>

Problems with smooth turn taking are defined by a significantly high number of non-smooth turn starts. We expect that the PI-children will start fewer turns smoothly compared to N-children. The relatively high frequency of morphological/syntactic errors that were observed (see 4.2) might signal an underdeveloped notion of sentence boundaries, necessary to decide where a turn of the interviewer ends. However, we do not expect an age effect in the PI-children, if they are like the N-children who did not produce significantly more smooth turn exchanges with age (Roelofs, 1998:81). For the statistical analysis we use ANCOVA's with the number of turns as covariate in order to reduce the possibility that an increase over time of the mean total number of smooth turn exchanges is caused by the decrease of the mean total number of turns with age (see 10.2).

A smooth turn exchange is defined as a start of a turn that immediately follows the previous turn (1) without a gap longer than one second between the turns and (2) without speech overlap with the previous turn, except for quick uptakes (Craig and Evans, 1989; Garvey and Berninger, 1981; Roelofs, 1998).

A quick uptake is a very quick and adequate reaction from the N- and PI-children to the initiatives of the interviewer (Example 8). In Dutch, this is considered a signal of good turn taking ability and not as impolite or rude.

Example 8 Quick Uptake (PI-child; age 6:10)

Interviewer: wat zijn dat <vuurstenen> ?>
(what is that flintstones?)

Ger: → <als> [<] als je nou <dan eh> inne pikkedonker zo tegen elkaar keihard <zo he> +"tsjtsjtsj <dan ken je> dan komen er vonkjes. (<if> [<] if you <then eh> in pitchdark so stone-hard <so eh> +"tsjtsjtsj, <then you can> then you get sparks)>
Non-smooth turn exchanges can be caused by either gaps or speech overlap between turns. We coded a non-smooth turn start as a gap, if the duration of the pause between turns was longer than one second\(^{15}\) (e.g. Jefferson, 1989). There are four kinds of gaps: (1) gaps between the turn of the interviewer and the turn of the child (Example 9); (2) gaps between the turn of a child and the turn of the interviewer (Example 10). When the interviewer or child leave more than one second between two turns, this is coded as (3) gaps between two turns of the interviewer (Example 11), and (4) gaps between two turns of the child (Example 12). The pause between two turns of the interviewer is coded as a turn chance for the child. Turn chances for the interviewer were not coded following Roelofs (1996; 1998).

Example 9  
(1) gap between the turn of the interviewer and the turn of the child (PI-child; age 6;2)  
Interviewer: wat gaan jullie dan doen?  
(what do you do next?)  
Carina:--> #8 dan gaan we op die fietsjes rijden.  
(then we go and ride on these little bikes)

Example 10  
(2) gaps between the turn of the child and the turn of the interviewer (PI-child; age 7;4)  
Interviewer: hebben jullie een hond thuis?  
(have you got a dog at home?)  
Rob: ja  
(yes)  
Interviewer:--> #1 hoe heet die?  
(#1 what is his name?)

Example 11  
(3) gap between two turns of the interviewer (PI-child; age 4;7)  
Interviewer: wat gaat Gert dan doen?  
(what does Gert do then?)  
Pricilla: O.  
(comment: no answer. child yawns.)  
Interviewer:--> #8 goh, wat moet jij gecuewen zeg.  
(gosh, what a yawn)

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\(^{15}\) We coded gaps by using a videotape with a time code and a video-recorder with slow-motion facilities. The video was stopped and the time code noted at the moment one speaker stopped talking (or nodding/head shaking) and the time code was noted at the moment (in most cases) the other speaker started talking (or nodding/head shaking). The gap in between was computed: #1 means a duration between 1-2 seconds, ... #3 means a duration between 3 and 4 seconds, etc. Turn internal pauses were transcribed, but not further analysed.
Example 12 (4) gap between two turns of the child (PI-child; age 6;5); conversational topic: why did the cat die?

Alexander:
Paraphrasis:

Alexander: heeft heel veel gepoep door ons huis (1).
Paraphrasis: hij (de kat) heeft heel vaak gepoep in ons huis.
(hi (the cat) shat a lot in our house)

Alexander: ¬
Paraphrasis: hij is ziek (2).
Paraphrasis: hij was ziek.
(#3 he was ill)

In Example 9, the PI-child responds after a long gap and therefore we scored this as a non-smooth turn start. The PI-interviewer's decision to wait for an answer can also influence gap lengths.

In Example 10, the PI-interviewer gives the PI-child one second to provide more information than is directly asked for. But when the PI-child does not give more information, the PI-interviewer takes a new verbal initiative. This interviewing style is found more in often interviews with the N-children.

In Example 11, the PI-interviewer waits a long time for an answer, but when nothing is said, the PI-interviewer is forced to take a new verbal initiative. Here, PI-children who do not take a turn violate the conditionally relevance rule, that states that each question needs an answer (Schegloff and Sacks, 1973; Mazeland, 1992). These instances are semantically/pragmatically marked and coded as a missing second pairpart (see 11.2 missed turn chances).

In Example 12, the PI-child pauses between turns to give the PI-interviewer a chance to take a turn. It is not unlikely that PI-children who have language difficulties create gaps on purpose in order to avoid speaking. Chance are great that the PI-interviewer will reply after a gap of one second caused by the PI-child in order to avoid long gaps between turns.

It is important to consider how far the conversational behaviour described here may be influenced by variables such as differences in interview style between the N-interviewers and PI-interviewers (e.g. Bishop et al., 2000).

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16 The N-interviewer start significantly more turns non-smoothly caused by a gap between one and two seconds than the PI-interviewers; ANCOVA with the number of non-smooth turn exchanges caused by a gap as covariate: group effect F(1,163)= 27.60, p<0.0001; no age or age*group interaction effect was found (nine-year-old PI-children excluded).
Differences in interview style

Although we are mainly interested in the N- and PI-children's turn taking performance, we observed that the PI-interviewers start significantly more turns with a gap longer than 4 seconds in comparison to the N-interviewer\textsuperscript{17}. Especially gaps longer than 4 seconds are striking indices of a particular interviewing style. These long gaps may influence the PI-children's linguistic performance positively, giving them an opportunity to respond, while the integration of the content, form and function of a previous turn and the planning of the next turn take some time. We observed that the PI-children will ultimately respond when the PI-interviewer waits long enough. This interview style is seen in general as a good eliciting strategy to interview LI-children (e.g. Heim, 2001).

In the following, we only will present the results with respect to gaps between the turn of the PI-interviewer and the turn of the PI-child (Example 9; type 1) and gaps between two turns of the PI-child (Example 12; type 4). Gaps are divided into four categories: (1) 1 - 2 seconds; (2) 2 - 3 seconds; (3) 3 - 4 seconds; (4) more than 4 seconds, in order to identify the very long gaps. Whereas shorter gaps might lead to temporary disturbances in a smooth turn exchange pattern, longer gaps are more semantically/pragmatically marked causing disturbances in the information flow. As was illustrated by Examples 9 and 12, PI-children who start turns non-smoothly caused by longer gaps force the PI-interviewer to be even more patient by waiting for the expected reaction to come. The PI-children thus slow down the speed at which the information is transmitted during the interview.

A non-smooth turn exchange can be caused not only by a gap, but also by speech overlap, further divided into initial overlap or interruption. Initial overlap occurs when interviewer and child both start talking at the same time, also called 'double-starts' (Craig and Evans, 1993), for example after a gap of more than one second (Example 13).

Example 13

<table>
<thead>
<tr>
<th>Interviewer:</th>
<th>Initial overlap (PI-child; age 7;6); conversational topic: the interviewer asks the name of PI-child's sister\textsuperscript{18}</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan: hoe heet je zus? (what is your sister's name?)</td>
<td>Bea.</td>
</tr>
<tr>
<td>Interviewer: \textsuperscript{=} #1 &lt;Bea?&gt; [&gt;]</td>
<td>#1 &lt;en soms&gt; [&gt;] noem ik haar Beha (#1 &lt;and sometimes&gt; [&gt;] I call her Bra)</td>
</tr>
<tr>
<td>Jan: \textsuperscript{=} #1 &lt;en soms&gt; [&gt;] noem ik haar Beha (#1 &lt;and sometimes&gt; [&gt;] I call her Bra)</td>
<td></td>
</tr>
</tbody>
</table>

Then, one of the two, mostly the one who caused the overlap, will give away his turn and the current speaker is likely to finish his message (Coulthard, 1985). In\textsuperscript{17} ANCOVA with the number of non-smooth turn exchanges caused by a gap as covariate: group effect $F(1,163)= 18.44, p<0.0001$; no age effects are found (nine-year-old PI-children excluded).\textsuperscript{18} The information between \textsuperscript{<>} brackets in combination with [>] and [<] signals speech overlap.
Example 13, the PI-child is the current speaker who finishes his message (joke about teasing). The 'winner' of the turn also may be the loudest, the most persistent or the one with a higher status (Smith and Leinonen, 1992:76).

An interruption occurs when children start talking, although the interviewer has not finished. Their contribution also is not an adequate reaction to what is said (Example 14).

Example 14  
Interruption by the child (PI-child; age 6;4). Conversational topic: anger caused by parents who do not allow child to play with friends at home

Interviewer:  
Paraphrasis: van wie mag je niet thuis spelen met vriendjes?  
(who does not allow you to play at home with friends?)

Susan:  
#3 van mama.  
(#3 mama)

Interviewer:  
en weet je ook <waarom> [>]?  
(and do you know <why> [>]?)

Susan:  
<niet> [<] en van papa ook niet.  
<not> [<] and papa doesn't either)

In Example 14, the PI-child ignores the question of the interviewer.

We all know from our daily experience with children, that they often are explicitly told in a class-room situation or at the dinner table at home not to interrupt, but to listen and to wait until the speaker has finished his message. In a situation where two or more adults are in conversation, children are also instructed not to interrupt. Parents with young children most of the time react with patience and keep talking to their adult conversational partner(s), while their children try very hard to interrupt by talking loudly (or non-verbally by pulling at clothes, pushing, even by crying). But in a more official setting, such as an interview, even one verbal interruption by the child is judged as impolite. Moreover, to interrupt is not without risk for the person who does so, as interrupting behaviour can be interpreted as rude, aggressive, self-centred and impolite or just disturbing. The beginning of the interrupter's message is often not intelligible and is therefore misinterpreted. In the conversational interview genre, interruptions are judged as severe semantic/pragmatic violations, when compared to the more accidentally caused initial overlaps or double-starts.

To explore some qualitative differences between the types of smooth and non-smooth turn exchanges, we analysed the distribution of smooth turn exchanges caused by no gap or a quick uptake on the one hand, and the distribution of non-smooth turn exchanges caused by a gap or by speech overlap on the other. To make quick uptakes the semantic/pragmatic interpretation of the preceding turn must be fully understood. Therefore, we expect to find fewer quick uptakes than smooth turn alternations caused by an absence of a gap in both populations. It is not clear
whether the distribution of both categories for non-smooth turn alternation will differ between the N- and PI-children.

### 10.6.2 Results: Smooth Turn Exchanges

First we give an overview in Table 10.8 of the results of the analysis of smooth and non-smooth turn exchanges calculated over the mean total number of turns in the N- and PI-children. It is obvious that the PI-children (80%), like the N-children (84%), start most turns smoothly. However, the PI-children start more turns (20%) non-smoothly than the N-children (16%). Comparable to the N-children non-smooth turn taking is more frequently a result of gaps (N-children: 15%; PI-children: 16%) than of speech overlap (N-children: 1%; PI-children: 4%).

<table>
<thead>
<tr>
<th>Turn exchanges</th>
<th>N-children (n=75)</th>
<th>PI-children (n=100)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smoothly</td>
<td>84%</td>
<td>80%</td>
</tr>
<tr>
<td>No gap</td>
<td>82%</td>
<td>78%</td>
</tr>
<tr>
<td>Quick uptake</td>
<td>2%</td>
<td>2%</td>
</tr>
<tr>
<td>Non-smoothly</td>
<td>16%</td>
<td>20%</td>
</tr>
<tr>
<td>Gap</td>
<td>15%</td>
<td>16%</td>
</tr>
<tr>
<td>1-2 sec</td>
<td>8.4%</td>
<td>8.5%</td>
</tr>
<tr>
<td>2-3 sec</td>
<td>4.8%</td>
<td>4.3%</td>
</tr>
<tr>
<td>3-4 sec</td>
<td>1.2%</td>
<td>1.9%</td>
</tr>
<tr>
<td>&gt;4 sec</td>
<td>0.7%</td>
<td>1.3%</td>
</tr>
<tr>
<td>Speech overlap</td>
<td>1%</td>
<td>4%</td>
</tr>
<tr>
<td>Initial overlap</td>
<td>0.5%</td>
<td>1.8%</td>
</tr>
<tr>
<td>Interruption</td>
<td>0.5%</td>
<td>2.2%</td>
</tr>
</tbody>
</table>

First, as expected, the PI-children, especially the five- and six-year-olds, start significantly fewer turns smoothly\(^{20}\) than the N-children. To look at possible age effects, we present in Figure 10.4 the mean percentage smooth turn starts per age group calculated over the number of turns. In the N-children there is a more stable

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\(^{19}\) When we present an overview of the general group results of a specific semantic/pragmatic analysis, we do not compare the nine-year-old PI-children with the mean value of the 'nine-year-old N-children' assessed by extrapolation, since we frequently observed relatively great fluctuations of semantic/pragmatic behaviour in the nine-year-old PI-children compared to the eight-year-old N-children and PI-children. Therefore, the results with respect to the nine-year-old PI-children are excluded from this presentation.

\(^{20}\) ANCOVA with the number of turns as covariate: group effect: \(F(1,164)=4.31, p<0.040\); no age effect, but an age*group interaction effect was observed \(F(4,164)=4.73, p<0.001\) (nine-year-old PI-children excluded). Accordingly, the mean total number of smooth turn exchanges does change across the age levels in both populations in different ways.
developmental pattern of smooth turn starts as opposed to the zigzag pattern in the PI-children. No linear age effects were found in either populations. Thus, since most turns (N-children: 80%; PI-children: 83%) are already taken smoothly by the four-year-olds, the ability to take turns smoothly further seems to improve very slowly and not significantly in the N-children with age (see also Roelofs, 1998:81-82). This zigzag pattern in the PI-children suggests that there are large individual differences between children in the ability to take turns smoothly.

Second, when we look at types of smooth turn exchanges (Table 10.8), we observe that the PI-children start significantly fewer turns smoothly with no gap between turns (78%) than the N-children (82%). The production of quick uptakes is quite low in both N- and PI-children (2%) as reported in the literature (Craig and Evans, 1993). In peer-peer interaction, it being a more competitive situation, quick uptakes may be used more frequently. It is therefore not surprising that a very small amount of quick uptakes is found in both N- and PI-children and that this is stable over time.

Figure 10.4 The percentage smooth turn starts (calculated over all turns) expressed by 75 N-children (Roelofs, 1998) and 120 PI-children

Third, when we look at types of non-smooth turn exchanges, these are caused more often by gaps than by speech overlap in both N- and PI-children. However, the

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21 One way ANCOVA (Polynomial contrast) with the number of turns as covariate and with age as independent variable (nine-year-old PI-children included).

22 ANCOVA with the number of turns as covariate and age as independent variable: group effect F(1, 164)= 4.80, p<0.030; no age effect, but an age*group interaction effect F(4, 164)=4.20, p< 0.003 was observed (nine-year-old PI-children excluded).

23 ANCOVA with the number of turns as covariate and age as independent variable (nine-year-old PI-children excluded). No group effects are found if we take the number of smooth turns as covariate or use non-parametrical statistics (Chi-square). The outcome that the N-children take more turns smoothly coded as a quick uptake increasingly with age (Roelofs, 1998:82) could not be confirmed using a different statistical method than Roelofs.
amount of non-smooth turn starts caused by a gap is comparable in the PI-children (16%) and N-children (15%). No significant main effects\(^{24}\) are found. It is obvious that the PI-children (7%) start significantly\(^{25}\) more turns non-smoothly caused by speech overlap than the N-children (4%). In the genre under investigation development there is no clear change with age in the number of non-smooth turns as a result of a gap or speech overlap. When we explore possible qualitative differences in the non-smooth turn patterns caused by different gap lengths and caused by different forms of speech overlap, some age effects could appear.

Fourth, when we focus on different types of gap length, we see from Table 10.8 that the N- and PI-children cause non-smooth turn exchanges by gaps between 1-2 seconds roughly more than half of the time and between 2-3 seconds one third of the time. Only few turns are started non-smoothly because of gaps between 3-4 seconds or longer than 4 seconds. Although we did not find any significant main effects\(^{26}\) with respect to gaps between 1-2 seconds, 2-3 seconds and 3-4 seconds, the PI-children start significantly more non-smooth turns caused by a gap longer than 4 seconds\(^{27}\) than the N-children (Figure 10.5). We see that the seven-year-old PI-children do relatively well when compared to the seven-year-old N-children who are doing relatively badly compared to the other age groups within the N-population.

\begin{figure}[h]
\centering
\includegraphics[width=0.5\textwidth]{figure10.5.png}
\caption{The percentage gaps of more than 4 seconds (calculated over all non-smooth turn starts caused by a gap) produced by 75 N-children (Roelofs, 1998) and 120 PI-children.}
\end{figure}

\begin{verbatim}
24 ANCOVA with the number of turns as covariate: no significant main effects found (nine-year-old PI-children excluded)
25 ANCOVA with the number of turns as covariate: group effect F(1,164)=12.85, p<0.0001 (nine-year-old PI-children excluded). One-way ANCOVA with the same covariate: no significant linear age effects observed in the N- and PI-children (nine-year-old PI-children included)
26 ANCOVA with the number of non-smooth turn exchanges caused by a gap as covariate (nine-year-old PI-children excluded)
27 ANCOVA with the number of non-smooth turn exchanges caused by a gap as covariate; group effect F(4,163)= 4.39, p<0.034 (nine-year-old PI-children excluded); no age effects are found for gaps longer than 4 seconds.
\end{verbatim}
The PI-children's production of these long gaps might be influenced by the particular interview style of the PI-interviewers, who tend to wait quite long for an answer. Long gaps between turns of both the PI-interviewers and PI-children make these interviews more time consuming than the interviews with the N-children.

Lastly, when we explore the different types of speech overlap (Table 10.8), we see that the PI-children start significantly more turns non-smoothly because of initial overlap (twice as many) and interruptions (four times as many) than the N-children, whereas the distribution of both categories is comparable. The PI-children even seem to interrupt the PI-interviewers more frequently than LI-children in the same situation. For instance, English-speaking LI-children (7;0 to 10;0 years) make twice as many interruptions as same-aged N-children in conversational interviews with an unfamiliar adult (Craig and Evans, 1993).

10.6.3 Conclusion: Smooth Turn Exchanges
The PI-children start more turns non-smoothly than the N-children, mainly because of extremely long gaps, sentence initial overlap and interruptions. When we look at variation between age groups, it are especially the five and six-year-old PI-children that produce relatively the most non-smooth turn starts. Thus, our findings support earlier reports that have signalled difficulties in smooth turn taking in PI-children (Fay and Schuler, 1980; Hobson, 1986; Audet and Tankersley, 1999; Westby, 1999) and LI-children (Johnson, Johnston and Weinrich, 1984; Rapin, 1987; Adams and Bishop, 1989; Bishop and Adams, 1989; Craig and Evans, 1989, 1993; Van Balkom, 1991). Additionally, the variable 'gaps longer than 4 seconds' may be one of those variables that could be an indicator for semantic/pragmatic impairment (see 3.5).

10.7 General conclusions: the ability to produce long turns and to take turns smoothly
From the analysis of communicative contributions and turns it is clear that no language delay or deficiencies are observed on these basic levels. The P- and N-children show no differences on the MLT or LLT. Both increase similarly with age in both populations. Despite these similarities, the PI-children produce significantly fewer long turns (> 3 T-units) than the N-children. When we look at individual differences within the two populations, we observe that significantly more PI-children than N-children are diagnosed as brief or excessive talkers. Again, these results show that the two populations are not comparable in their ability to produce long turns.

28 ANCOVA with the number of turns as covariate; group effect F(1,164)= 4.48, p<0.036; no age or age*group interaction effect is observed (nine-year-old PI-children excluded).
29 ANCOVA with the number of turns as covariate; group effect F(1,164)= 5.05, p< 0.026; no age- or age*group interaction effect is observed (nine-year-old PI-children excluded).
30 ANCOVA with the number of non-smooth turn starts caused by speech overlap as covariate; no main effects found.
Turn taking abilities

Long turns. The brief talkers have severe difficulties in producing longer turns, while the excessive talkers have difficulties in producing a coherent longest turn in the conversational interview genre. Morphological/syntactic and semantic/pragmatic errors frequently co-occur in the longest turn of excessive talkers. The LI-symptom ‘talking excessively’ proved to be not exclusively comorbid with ADHD or PDD-NOS. Surprisingly some PI-children with internalizing disorders are also identified as excessive talkers.

The PI-children start significantly more turns non-smoothly than N-children, mainly because of extremely long gaps, sentence initial overlap and interruptions. This may be related to the PI-children's morphological/syntactic deficiencies (see 4.2). Deficiencies in executive function skills that are involved in encoding and decoding sufficiently rapidly for precision-timed turn taking (see 2.3.1) (Craig and Evans, 1989) may also play a part. Clinicians would presumably have judged the PI-children as having no severe turn taking disabilities or none at all, since approximately 80% of all turns were smoothly taken by the PI-children. Deviant semantic/pragmatic turn taking behaviour affects a small part of the exchange, and can only be measured by making a detailed language analysis.

In sum, our findings support earlier reports that signal difficulties in smooth turn taking in PI-children (Fay and Schuler, 1980; Hobson, 1986; Audet and Tankersley, 1999; Westby, 1999). The results are clear indices for the existence of a deviant semantic/pragmatic development in the area of turn taking in some but not all of the PI-children.